

**August Meeting****Friday, August 18
7:30 pm**

**Karen Siemsen, Tom Kramer,
Dick Brown****C.E.R.T and Amateur Radio - A
Good Combinatin****Our Savior's Lutheran Church
1035 Carol Lane
Lafayette, CA****Radiation Belt Remediation Plan Could Affect HF Propagation**

NEWINGTON, CT, Aug 15, 2006—A New Zealand university research group believes a US Defense Advanced Research Projects Agency (DARPA) "Radiation Belt Remediation" (RBR) plan could cause major worldwide disruptions to HF radio communication and GPS navigation. DARPA reportedly envisions the "Radiation Belt Remediation" (RBR) system as a way to protect low-Earth orbiting (LEO) satellites from damage caused by severe solar storms or even from high-altitude nuclear detonations. The New Zealand-based research group suggests, however, that policymakers need to carefully consider the implications of the project. Headed by Otago Physics Department researcher Craig Rodger, the research group says RBR could significantly affect radio propagation from several days to a week or longer.

"We've calculated that Earth's upper atmosphere would be dramatically affected by such a system, causing unusually intense HF blackouts around most of the world," Rodger said in an Otago University news release. "Airplane pilots and ships would lose radio contact, and some Pacific Island nations could be isolated for as long as six to seven days, depending on the system's design and how it was operated." GPS would likely also be disrupted on a large scale, he added. System tests would employ extremely high-intensity, very low frequency (VLF) radio waves to "flush" particles from radiation belts and dump them into the upper atmosphere. The disruptions would result from the deluge of dumped charged particles temporarily changing the ionosphere from a "mirror" that bounces HF radio waves around the planet to a "sponge" that soaks them up, Rodger says.

The group's paper, "The atmospheric implications of radiation belt remediation," appears in the August edition of the international journal *Annales Geophysicae*. Otago University researchers collaborated with the British Antarctic Survey, the Sodankylä Geophysical Observatory in Finland and the Finnish Meteorological Institute in its preparation.

Unclassified US Department of Defense budget documents from earlier this year propose at least initially using the High Frequency Active Auroral Research Project (HAARP) near Gakona, Alaska, "to exploit emerging ionosphere and radio science technologies related to advanced defense applications." HAARP is jointly operated by the US Air Force and the US Navy. The project appears to be included under a program called "Sleight of HAND" (SOH).

"The effects of High Altitude Nuclear Detonations (HAND) are catastrophic to satellites," the budget report explains. "HAND-generated charged particles are trapped for very long periods of time, oscillating between the earth's north and south magnetic poles. This enhanced radiation environment would immediately degrade low-earth orbiting (LEO) spacecraft capability and result in their destruction in a short period of time."

The military budget documents refer to the SOH program as "a proof of concept demonstration" of technology and techniques to mitigate the HAND-enhanced trapped radiation, with the goal of accelerating "the rate of decay of trapped radiation from the LEO environment by a factor of 10 over the natural rate of decay."

Phase 1 of SOH would use a high-power ground-based source of VLF radiation - at least initially using the HAARP facility - "propagating through the ionosphere to deflect the trapped radiation deep into the atmosphere." If that proves valid and cost-effective, space-based demonstrations and tests apparently would follow.

The New Zealand research paper caught the interest of at least one newspaper, the New Zealand Herald, and word of the plan soon was circulating within the worldwide Amateur Radio community. ARRL Propagation Report Editor Tad Cook, K7RA, investigated and filed a special propagation bulletin August 15.

"When I first heard of this on Monday morning, I thought it must be something from

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Mt. Diablo Amateur Radio Club W6CX

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The *Carrier* is a monthly publication of the Mount Diablo Amateur Radio Club (MDARC). It is the policy of the editor to publish all material submitted by the membership provided such material is in good taste, relevant to amateur radio and of interest to MDARC members, and space is available.

All material must be submitted to the editor by the first day of the month of publication. Material is accepted on a first-in, first-out basis. Articles and other material may be submitted via Internet email to carrier@gardnerclan.net or delivered to the editor at the address listed in the club roster. Material will be accepted in plain ASCII or rich text format (RTF). Material may also be submitted as hardcopy.

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General Meeting Minutes

July 21, 2006

Vice-President Sheldon Lawrence, KI6ATA, called the meeting to order at 7:30 p.m. About 45 members and guests attended. Sheldon called for introductions; two guests were present.

Jay Caldis, KT6Y, VE Examiner, reported 6 tested; all passed.

The minutes of the prior meeting were approved as printed in the *Carrier*.

Treasurer Dick Schulze, AA6DL, reported that the treasury contained a total of \$45,771.20 in all accounts, less any pending expenses. Dick noted that income and expenses were on track as in the budget.

VP Sheldon called for committee reports:

- EC Dana Jones, K6BRR, noted that there was no RACES training tomorrow, but there would be training on the third Saturday of August.
- Technical Committee: Trevor Raty, KG6MDW, reported on various problems with the repeaters: the 2m amp failed again and will be sent back to Henry. Work is proceeding on the voter project.

At 7:40 VP Sheldon announced a recess before the main speaker.

At 7:50 Sheldon reconvened the meeting and introduced substitute speaker Trevor Raty speaking on ATV. Trevor described the MDARC 1.2 gig ATV repeater situation and protocols, and displayed sample ATV equipment. The MDARC ATV net is Thursday evenings at 8 p.m. He also displayed samples of desirable coax. Trevor related the success story of a "hatcam" at 2003 Pacificon.

After Q & A, Sheldon adjourned the meeting at 8:45 p.m., for the drawing. The HT was won by Ray Bryant, N6RBY.

Respectfully submitted, Paul Dickey, N6JOX, Secretary

Board Meeting Minutes

August 7, 2006

President Marty Heyman, W6MDH, called the meeting to order at 7:00 p.m.

Other Board Members present: Vice-President Sheldon Lawrence, KI6ATA, Secretary Paul Dickey, N6JOX, Treasurer Dick Schulze, AA6DL, Directors Jay Caldis, KT6Y, Trevor Raty, KG6MDW (until 7:30), and Bob Green, K6GD. Other club members present: Past Pres. & Tech. Committee Chairman Trevor Hall, WA6JAU, Tim Barrett, K6BIV, Tech Committee Member Howard Burk, KE6PTT, and Dave Gordon, N6SWE. Others present: Paul Girard.

The minutes of the July 3 meeting were APPROVED, as printed in the *Carrier*.

Treasurer Dick Schulze reported a balance of \$45,314.84, total of accounts, including three CDs. Dick also noted that expenditures were within budget.

Committee Reports:

- EC: Marty noted that EC Dana was on excused absence. He reminded all that the Concord Safety Fair would be coming up Sept. 23, the same time as the Club picnic.
- Marty reported that the Membership Chairman has resigned, effective July 4, but would help until the end of the year or before if a replacement can be found.
- Marty noted that Director Joe Cusumano had resigned and a replacement was needed.
- Tech. Com. Chmn. Trevor Hall REPORTED on several items:
 - the repeater site at Vollmer has changed ownership; negotiations are progressing. This has slowed work on APRS and the voters.
 - the ATV controller work is awaiting purchase of cable.
 - the amplifier is being returned to Henry Radio for a refund.
 - usage of Echolink and IRLP is running several daily.

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Field Day 2006



Board Meeting Minutes

Continued from page 2

Marty advised the Board that he would pursue appointing a third member of the Nominating Committee, with himself and Bob Green as the other members.

Marty asked the Audit Committee (Marty, Paul, Jay) to pursue the completion of the audit on the Club's books for 2005. Paul will set up a new date with Treasurer Dick.

(Because of a self-identified conflict of interest regarding the following discussion, Trevor Raty was excused at 7:30).

Referring to the previous discussion of a one-year rental contract with DTS Company for wireless to maintain the ILRP/Echolink service, the Board discussed the following:

- the current service with Speakeasy may be cancelled without fee.
- requirements for a fixed term, price, and notification policy.
- guarantee of bandwidth and class of contract.
- no credit card requirement.
- payment of previous charges.

The Board voted 5-1 to ask Marty to clarify and/or negotiate these items, and bring a changed contract back to the Board for approval.

President Marty adjourned the meeting at 8:35 p.m.

Respectfully submitted, Paul Dickey N6JOX, Secretary

Radiation Belt Remediation Plan

Continued from page 1

a fringe Web site peddling dark conspiracy theories," Cook commented, "but the newspaper reporting the news is real, and so is the team of scientists from New Zealand, the UK and Finland." Cook contacted Rodger to learn more.

"He proved very cooperative, accessible and helpful and told me RBR is a serious project, that 'money is starting to appear to investigate it in more detail,' and 'US scientists with military connections are treating it seriously'," Cook reports.

Cook says he shared with Rodger speculation by QST Contributing Editor Ward Silver, N0AX, to the effect that "the sheer energy needed to accomplish [RBR] would tend to rule it out from the start, and I don't know where they would erect the necessary antennas."

Responded Rodger: "This would be true, but they are hoping to rely on some of the non-linear processes in space plasmas, stealing the energy from the radiation belts to get the wave amplitudes high enough. We know this is possible—in theory—as it happens naturally already. We don't know how easy it will be to get it happening under our control."

Rodger says there are two plans to erect the necessary antenna. "One is to fly VLF antenna in space. This could be a power problem," he told Cook. "But for ground-based systems, you probably already know that most major naval powers have big VLF transmitters dotted over the globe."

Two US Navy VLF transmitters have power output capability in the megawatt range, Rodger remarked. "While these are designed to keep the signals mostly under the ionosphere, it shows the possibility for building big powerful antenna." No mention of HAARP appears in the group's research paper.

The research group also calculated RBR's potential to affect the ozone layer but found that ozone depletion would be short-lived and similar to that resulting from natural processes such as large solar storms and volcanic eruptions.

K7RA Solar Update

SEATTLE, WA, August 11, 2006—On four days this week the sun was spotless, so the average daily sunspot number for the week dropped over 11 points to 8.6. Sunspot numbers are now recovering and climbing, from zero on Monday to 12, 25 and 37 on Tuesday through Thursday. Sunspot numbers and solar flux should continue a modest recovery through next week. When the sunspots were zero, the solar flux (a measurement of 10.7 GHz energy from the sun, observed at a station in British Columbia) was below 70. Now solar flux is expected to rise in the short term to 85 or more.

Rising sunspot numbers and solar flux mean higher MUF (Maximum Usable Frequency), although not a lot higher. For instance, using propagation prediction software, for today with zero sunspots, the MUF over the path from Philadelphia to Germany would go above 17 MHz from 1430-2230z, to a maximum of 17.6 MHz. But with an average sunspot number of 40, the MUF over the same path rises above 19 MHz from 1400-2230z, peaking at 19.8 MHz. If the sunspot number were 120 instead, a figure we won't observe for a few years, the MUF would rise above 23 MHz from 1430-2130z, peaking at 23.8 MHz. The difference on those three scenarios would be whether 20 meters, 17 meters, or 15 meters is the highest practical band to use.

With existing conditions as they are, that path to Germany would be best on 17 meters from 1230-0000z, with stronger signals toward the end of that period, but the best chances for an opening around 1730-2100z. 20 meters should have slightly stronger signals, with openings beginning weakly around 1130z and signals gradually increasing to 0200z, and the signals falling off afterward. Best bet would be 2130-0100z on 20 meters.



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CALENDAR OF EVENTS

August 7	7:00 pm	MDARC Board Meeting	Fuddrucker's Diamond Ave., Concord
August 18	7:30 pm	MDARC General Meeting	Our Savior's Lutheran Church
August 31		September <i>Carrier</i> Deadline	
September 4	7:00 pm	MDARC Board Meeting	Fuddrucker's Diamond Ave., Concord
Thursday Evenings	7:30 pm	MDARC Club Net	147.06 & 441.325 MHz

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